A Work Project, presented as part of the requirements for the Award of a Master Degree in Economics from the NOVA - School of Business and Economics

Beyond Trade: Economic Sanctions and their Impact on the Components of GDP

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A project carried out on the Master in Economics Program, under the supervision of:

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January 2019

Table of Contents

Abstract

Economic sanctions have become a favored instrument in the foreign policy toolbox for their ability to accomplish strategic objectives while averting the costs of warfare. Despite their frequent use, the economic consequences of sanctions on the target economy remain perplexing to both scholars and policymakers alike. While most empirical studies analyze the effects of economic sanctions on bilateral trade, our paper assesses the impact of sanctions on GDP through its five principal components: imports, exports, consumption, government expenditure, and investment. Using a fixed effects model, we uncover how economic sanctions modestly affect the target country's imports, exports, and consumption; and show how additional factors such as the involvement of the United States or supranational institutions, as well as the political regime of the target country, influence our results.

Keywords: Economic sanctions, International trade, GDP, Fixed effects

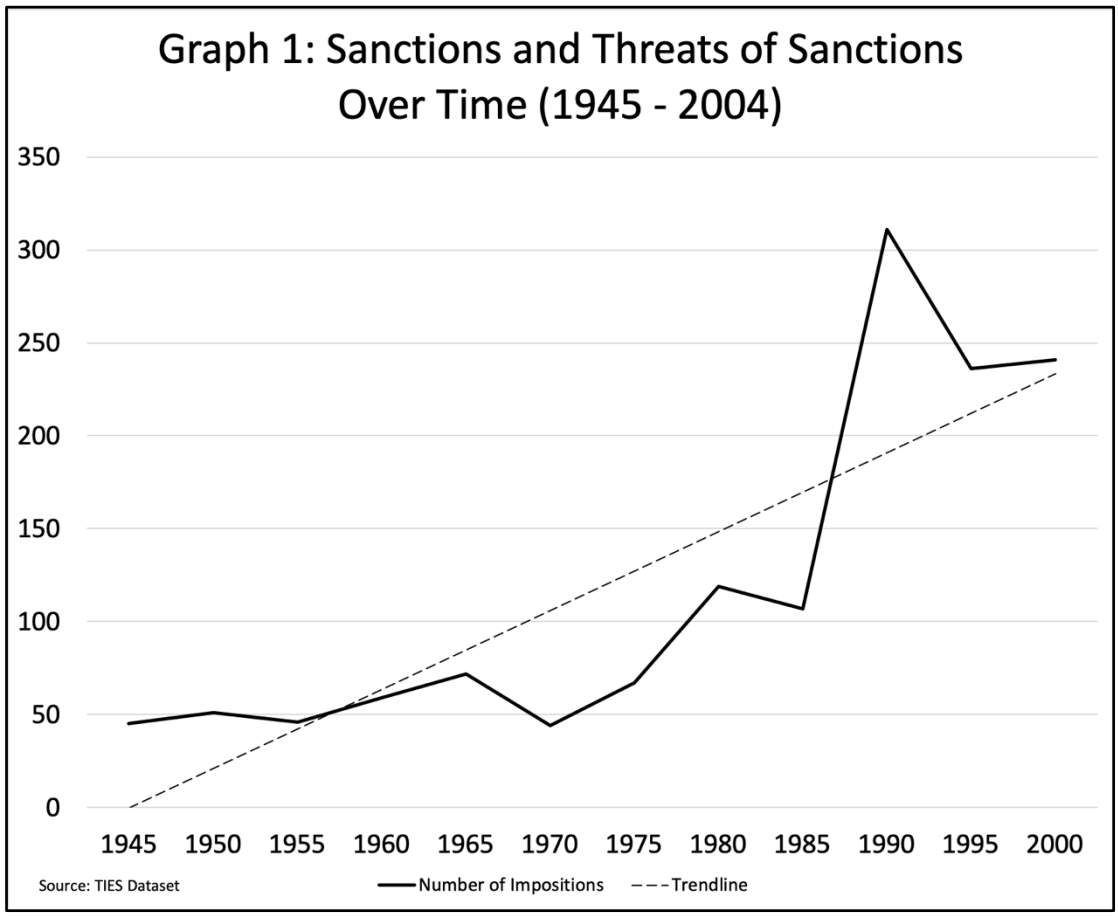
1. Introduction

Following the great destruction of World War II, nations and supranational organizations sought for an alternative to conventional warfare that would still allow them to pursue their foreign policy goals. Following this turning point, economic sanctions have become an increasingly popular tool for coercing foreign governments' behavior in order to achieve international policy objectives, exemplified by Graph 1 on the following page. The broad use of sanctions occurred extensively throughout the Cold War as both the United States and USSR used this initiative to manipulate regime change, impair military capabilities, and deter not only each other, but other nations seeking to align with the other side's political ideology (Hufbauer et al., 2008). In the 21st century, the use of economic sanctions is still abundant. In 2018, the United States decided to remove itself from the Iran nuclear deal and reimpose a complete economic embargo in order to pursue its geopolitical objectives in the middle east. Sanctions from western nations are continuing to accumulate on Russia for its role in the annexation of Crimea. A US embargo of Cuba dating back to 1958 continues to constrict the flow of goods, investment, and people between the two countries. These instruments of foreign policy are likely to continue to be used extensively (Haass, 1998). It is now more important than ever that policy makers understand the ramifications, both economically and politically, that come with their implementation. This study aims to highlight these enigmatic effects that are essential to understand their overall empirical outcomes.

Studying the historical effects of sanctions allows policymakers to understand not only the direct impact of their implementation, but also any collateral effects that may unintentionally affect a nation's economy. Despite sanctions prevalence for centuries, assessing the empirical outcomes of sanctions on a target government remains onerous. Due to a myriad of factors that may affect an outcome, forecasting the empirical effects is difficult to quantify (Smeets, 2018). Sanctions that were designed to influence the decision making of

a target's leadership often lead to unforeseen political and economic outcomes (Bierstecker et al., 2013). It is these unforeseen effects regarding the components of GDP that this analysis will investigate.

Our study uses a panel data, fixed-effects model in order to analyze the effect of economic sanctions on GDP, specifically through its five primary components: consumption, investment, government expenditure, exports, and imports. Although studies investigating the impact of economic sanctions on GDP or bilateral trade flows have been conducted (i.e. Hufbauer et al., 1997), a study scrutinizing sanctions and their effect on GDP through each of its primary elements has yet to be pursued. This study will be further divided into three additional cases: the impact of United States vs. non-United States sanctions, the backing of sanctions by a supranational institution, and the effects on both democracies and autocracies.



2. Literature Review

A Theory of International Conflict Management and Sanctioning (Garoupa and Gata, 2000) discusses the inner workings of economic sanctions through a game theoretic model. The model assumes an endogenous imposition of sanctions that allows it to capture the myriad of effects that are demonstrated in practical case studies. The authors first explain the "naïve model", which assumes an exogenous application of sanctions. In a non-cooperative game, each country must decide how to allocate their endowment of a finite resource to three capital assets: civilian productive capacity to produce wealth, offensive weapons to appropriate wealth from foreign countries, and defensive weapons used to prevent appropriation. Conflict from weapons is a destructive activity with a cost higher than that of trade. For this reason, third party countries can issue sanctions on a country to limit its offensive capabilities that jeopardize peace. Lastly, a country's population is split between those in opposition to war - "doves" - and those who prefer expansionist policies to appropriate resources, known as "hawks".

Given this simplistic model, the authors draw three conclusions. First, they find that an increase in the arms embargo rate (sanctions) is always effective and will lead to a decrease in the equilibrium investment in offensive weapons. Secondly, as the level of relative political influence demonstrated by doves increases in a country, civilian productive capacity will also increase through a decline of investment in offensive weapons. Lastly, the defensive spending of a foreign country j is a reflection on the embargo rate and political influence of the home country i. This means that if country i's offensive capabilities fall either due to sanctions or a greater political influence exerted by doves, then country j will reciprocate by reducing their defensive spending. According to these theories, sanctions act as an effective deterrent to conflict through decreased investment in offensive weapons. In other words, the sanction's impact on the target's trade and GDP levels prevails over the

potential gains from wealth appropriation. The authors close by stating that these conclusions are naïve, and not a reflection on real world events.

Garoupa and Gata expand upon the original model by adding a political marketplace, such as the United Nations, that allows nations to trade their political influence with one another. In the model, all countries are divided into two different groups: those that benefit from an imposition of sanctions against a specific country and those that don't. Some countries are willing to pay a specific price for an additional unit of sanctions to be imposed because they benefit from peace. Other countries, such as weapons exporters, are willing to pay a specific price for those sanctions not to be implemented, since they benefit in times of conflict. In the event of a sanction, the target will try to "buy allies" in the international political market by offering trade concessions, such as dividing the appropriations that the target gained from conflict. Through "buying allies", the political marketplace diminishes the effect that sanctions would've had in an exogenous world, such as the original model. In some cases, "buying allies" leads to an increased level of weapon purchases. Additional weapons amplify the amount that an attacker can appropriate from a defender. This amplification exacerbates the acquisition of weapons, therefore leading to greater conflict. These counterproductive ramifications are also described by Hufbauer et al. 2008, who explain that the presence of sanctions can lead to the presence of "black knights": third parties that actively support a sanctioned nation. More commonly, the political marketplace may allow the target to divert their bilateral trade to other partners. The political marketplace allows the aggressor to mitigate the damaging costs of sanctions through third parties. The use of a political marketplace to influence other countries is a reoccurring theme in the event of sanctions and will significantly explain some of the conclusions in our study.

3. Empirical Methods and Data

3.1 Data

The data analyzed in our study totals over 11,500 observations spanning across 199 countries beginning from 1960 to 2005. All macroeconomic data was compiled from the World Bank's *World Development Indicators*. This analysis uses the dataset *Threat and Imposition of Sanctions (TIES)* (Clifton, Bapat, and Kobayashi., 2014) which consists of 1,412 sanction episodes spanning from 1945 - 2013. What makes the TIES dataset truly superior other sanctions datasets is the inclusion of additional episodes involving only threats or institutions. These additional factors allow for a more comprehensive analysis that accounts for the heterogeneity that arises between episodes. The two datasets were combined and arranged in panel form. All of the models are run within Stata 13.

3.2 Methodology

This study assesses the impact of economic sanctions on GDP and its five components by examining the widest dataset on sanctions available. The primary components of a nation's GDP are:

(1) GDP = Consumption + Investment + Government Expenditure + (Exports – Imports)

Economic sanctions are associated with a plethora of responses and subsidiary developments that are difficult to empirically characterize. We will use a common framework and empirical methodology to examine the response to sanctions, as summarized by the following hypotheses:

I. Hypothesis 1: The presence of economic sanctions will negatively affect all of the components of GDP.

II. Hypothesis 2: Sanctions issued by the US are stronger than sanctions issued by other nations due to greater economic leverage.

III. Hypothesis 3: Sanctions backed by international institutions are more damaging to the target because of an increased sense of legitimacy.

IV. Hypothesis 4: Autocracies are more adversely affected in the presence of sanctions.

To estimate the effect of the varying levels of economic sanctions on GDP and its components, the following specification is estimated:

$$(2)\ ln(y_{it}) = \beta_o + \beta_1 Sanctions_{i,t} + \beta_2 Demographic_{i,t-1} + \beta_3 Political_{i,t} + \alpha_i + \delta_t + \epsilon_{i,t}$$

Where dependent variable $ln(y_{it})$ represents the log of the real components of GDP: imports, exports, consumption, government expenditure, and investment - in country i at time t.

The variable $Sanctions_{i,t}$ is classified into four, mutually exclusive dummy variables, depending on its intensity, as defined by Wood (2008): Threat, Limited, Moderate, and Extensive. These four dummy variables take a value of 1 if country i is being sanctioned at time t, and 0 otherwise.

$$(3)\ \ Sanctions_{i,t} = \begin{Bmatrix} Threat_{i,t} \\ Limited_{i,t} \\ Moderate_{i,t} \\ Extensive_{i,t} \end{Bmatrix}$$

A sanction threat refers to a warning made before the sanction is imposed. This also includes threats that were made but never followed by the imposition of sanctions. The threat dummy takes a value of 0 if a sanction was issued without any warning made. Sanction

threats are only recorded once - at time t, as the effects of threats are likely to quickly subside once it is determined that the threat will not evolve into implementation. Limited sanctions are comprised of more modest means to coerce a target, such as asset freezes, travel bans, or the withdrawal of foreign aid. Moderate sanctions comprise of more severe actions taken by the sender, such as import or export restrictions. Extensive sanctions represent the most comprehensive restriction of capital flow through blockades or total economic embargoes. In cases where countries have been subject to multiple tiers of sanctions applied at a given time t, we consider only the most severe. Hypothesis 2 will be tested by means of a dummy variable for threats or sanctions issued by the United States. A significant coefficient suggests a disparity between sanctions imposed by the United States and other countries. In the same manner, we test Hypothesis 3 through the introduction of dummy variables which take the value of 1 if an international institution deliberated over or took action in an episode. A similar is procedure is followed in Hypotheses 4 if the target is an autocracy.

$$(4)\quad Demographic_{i,t-1} = \begin{Bmatrix} log(GDP\ per\ capita)_{i,t-1} \\ \log(Population)_{i,t-1} \end{Bmatrix}$$

$Demographic_{i,t-1}$ controls for several demographic characteristics that explain the dependent variable. We used the lagged log of the GDP per capita variable and the target country's population as determinant controls for the GDP components. The variable log of GDP per capita is lagged in order to mitigate issues concerning reverse causality. The log of population from period $t-1$ is added in order to account for scale effects which may affect the level of the components of GDP.

$$(5)\quad Political_{i,t} = \begin{Bmatrix} Minor\ Conflict_{i,t} \\ \text{Major Conflict}_{i,t} \end{Bmatrix}$$

A political control, $Political_{i,t}$, is added in order to account for any varying political factors that could affect the outcome of economic sanctions. A control for conflict is taken from the UCDP/PRIO Armed Conflict Dataset (Gleditsch et al., 2002 and Eck and Pettersson, 2018) if the nation was experiencing conflict during time t. The control is divided into two

,dummy variables, depending on the level of intensity: minor conflict (between 25 and 999 battle-related deaths in a given year) and major conflict (over 1,000 battle-related deaths in a given year). Since many sanctions are issued when a nation is experiencing conflict, this control attempts to separate the effects of the economic sanction from those of political instability. While testing hypothesis 4, a dummy variable labeled "autocracy" takes a value of 1 if the government is an autocracy and 0 otherwise (Ulfelder, 2012). This dummy variable will be interacted with the levels of economic sanctions in order to assess whether autocracies are more adversely affected by sanctions or not.

In order to account for unvarying country characteristics affecting the components of GDP, we introduce a fixed effect component α_i. α_i is a country-specific effect composed of both observable and unobservable, time-invariant factors found in country i to account for individual country heterogeneity. A time-fixed effect δ_t is added in order to account for a broad time trend that may affect all countries simultaneously. Lastly, the error term is denoted $\epsilon_{i,t}$. Errors are clustered at the country level in order to control for individual correlation.

4. Results

4.1 Impact on GDP Components

On the following page, we present the impact of all economic sanctions on GDP and its components throughout the world. The upper section of the table shows the effects of sanctions on the various dependent variables while the bottom half shows the effects of the explanatory variables. In general, the presence of sanctions has a negative impact on the components of GDP, particularly to imports, exports, and consumption. Additionally, the independent variables of GDP per capita, population, minor conflict, and major conflict; are

relatively strong in their explanation of the dependent variable. The behavior of these variables will remain consistent throughout the remaining hypotheses.

Table 1: Impact of Economics Sanctions

Variable Log( )	(1) Imports	(2) Exports	(3) Consumption	(4) Government	(5) Investment
Threat	0.0616** (0.011)	0.0728*** (0.005)	0.0231** (0.038)	0.0502*** (0.004)	0.00984 (0.809)
Limited	-0.123*** (0.002)	-0.156*** (0.002)	0.0152 (0.491)	-0.0198 (0.642)	0.0118 (0.907)
Moderate	0.0274 (0.488)	0.0412 (0.338)	0.0282 (0.256)	0.00129 (0.975)	-0.0202 (0.673)
Extensive	-0.135* (0.085)	-0.0985 (0.337)	-0.0669* (0.052)	-0.0122 (0.821)	0.176 (0.309)
$Log(GDP\ Per\ Capita)_{t-1}$	0.472*** (0.000)	0.528*** (0.000)	0.523*** (0.000)	0.567*** (0.000)	1.009*** (0.000)
$Log(Population)_{t-1}$	0.195 (0.238)	0.137 (0.500)	0.529*** (0.001)	0.210 (0.266)	-0.604 (0.151)
Minor Conflict	-0.0767 (0.102)	-0.147** (0.015)	-0.0745** (0.017)	-0.0740* (0.064)	0.172 (0.120)
Major Conflict	-0.139** (0.044)	-0.217** (0.013)	-0.0974* (0.073)	-0.0218 (0.723)	0.195 (0.199)
Constant	13.59*** (0.000)	13.95*** (0.000)	9.415*** (0.000)	12.17*** (0.000)	21.95*** (0.003)
Observations Within R^2	5123 0.909	5122 0.891	4773 0.930	4957 0.892	1745 0.660
p-values in parentheses	* p<0.1	** p<.05	*** p<.01		

Source: World Bank Indicators & TIES Dataset

The most noticeable observation is the statistically significant, positive effect for the threat variable. This could be due to an anticipation effect, a rush to import, export, speed up government expenditure and, to a lesser extent, consume in an anticipation of future

shortages (Go, 1991). If a threat of sanctions is put forward, consumers may be inclined to purchase more goods today while they are still available at affordable prices. This anticipation effect of higher future prices could explain the rise of consumption (2.3%) and imports (6.2%). Higher prices and lack of available goods are why foreign importers may stockpile their inventory today in the event of a threat, driving up exports 7.3% (Gillespie, 2018). Lastly, following the threat of sanctions, governments increase their expenditure (5%) of goods commonly affected by economic sanctions, such as military equipment, energy, and agriculture.

Unsurprisingly, economic sanctions clearly affect the target's imports and exports. Imports were most severely affected by the presence of sanctions. With the presence of limited sanctions, imports were shown to decrease by 12.3% at a statistically significant level, while the presence of extensive sanctions were even more dramatic with a decrease of up to 15.6%. Most senders possess a greater degree of leverage, derived from their larger, more diverse economy. In a study by the Peterson Institute for International Economics, the average sender's economy was 187 times larger than the target's (Elliot, 1997). This leverage gives the senders the capability to cause greater damage than a target may be able to absorb or reciprocate.

The target country's exports also react similarly to their imports, but to a lesser extent. Unlike imports, extensive sanctions do not have a statistically significant, negative correlation with exports. This agrees with a study by PIIE which finds that, "while limited sanctions have a relatively larger impact on exports than imports, extensive sanctions have exactly the opposite relative impact" (Hufbauer et al., 1997). This outcome could be due to the endogenous nature of sanctions created by a self-selection bias. A sender would be less likely to enact moderate or severe restrictions on a major trading partner with whom they are dependent on for vital imports. For example, as recently as October of 2018, the United States was very hesitant to punish Saudi Arabia for its role in killing the Saudi journalist

Jamal Khashoggi, due to both Saudi Arabia's influence in the oil industry and their geopolitical partnership with the United States (Colgan, 2018). In contrast, the United States would likely be less hesitant to sanction a small, isolated economy, with whom it is not dependent on for vital resources. For this reason, senders may be more reluctant to sanction countries who export vital resources.

Surprisingly, moderate sanctions are benign to the target's imports and exports, agreeing with the results of other fixed effect models (Frank, 2017). This is most likely caused by an omitted variable bias that is not captured in the model, such as trade diversion. As globalization thrives and the world economy becomes more interconnected, it is easier for nations to trade with one another. Countries that suffer under moderate sanctions may simply divert their imports elsewhere, avoiding the full effect of sanctions (Jildenbäck, 2017). These procedures are common and may mask the true effects caused by sanctions. One possibility is that imposed sanctions may prompt powerful allies of the targeted nation to act as "black knights" by offering economic support (Hufbauer et al., 2008). This frequently occurred throughout the Cold War as both the Soviet and American governments sought to counteract the efforts of their rivals in order to gain political influence (i.e. Cuba, Nicaragua, or Yugoslavia). This is equivalent to the "buying allies" effect in the political marketplace that is described by Garoupa and Gata, since some nations gain through a redaction of sanctions.

Extensive sanctions are the only tier that reports a negative impact on consumption. In the presence of extensive sanctions, consumption falls by 6.7% at a statistically significant level. Sanctions can adversely affect consumer expectations and lead to an increase in prices. Economic sanctions indicate an element of economic or political uncertainty, making consumers more cautious (Ezzati and Salmani, 2017). Additionally, due to a constriction of imports, consumers face higher prices. Sanctions reduce the availability of some products and

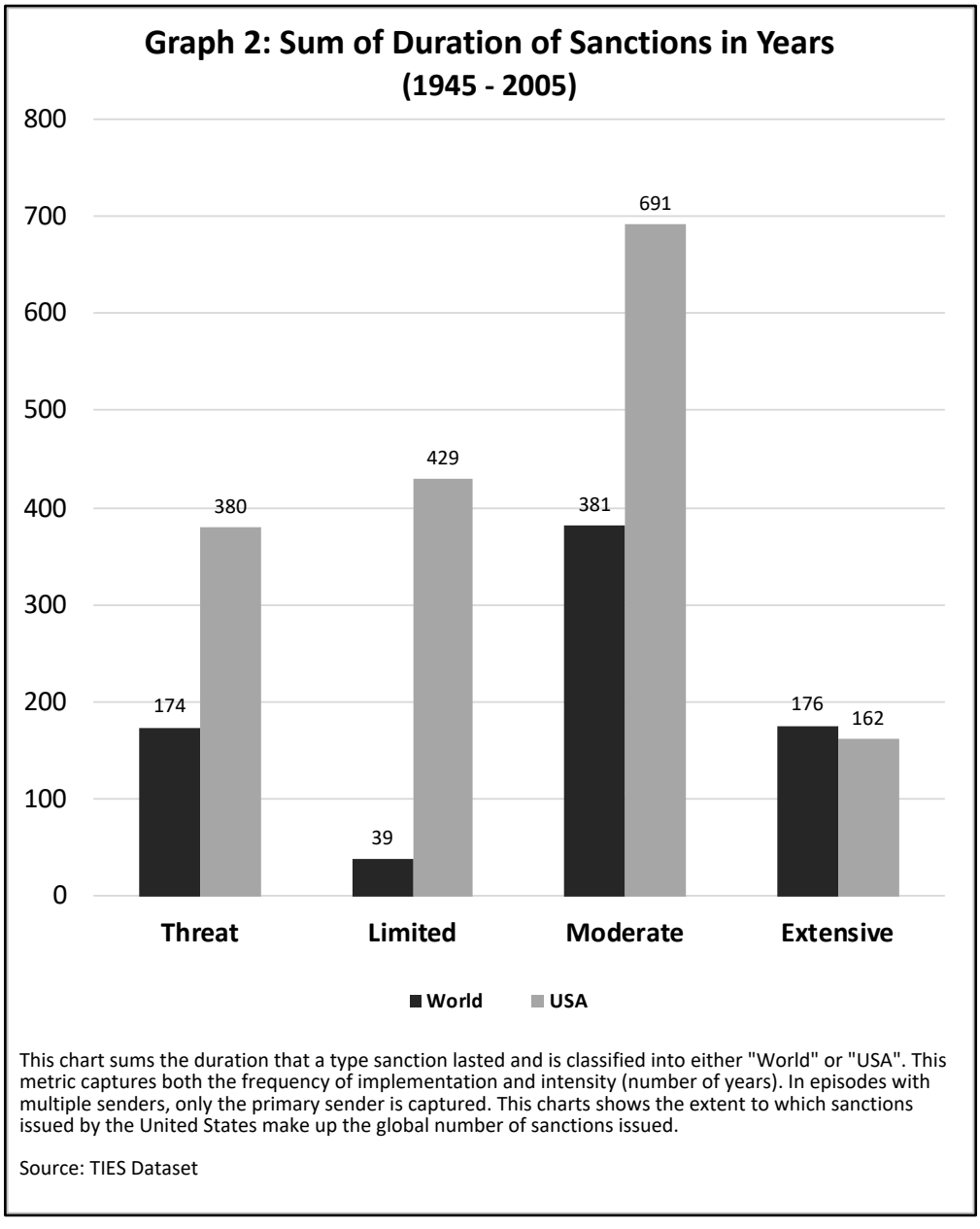
may force producers to source their products from more expensive areas, driving up prices[1]. This constriction of available goods and the rise of prices strangle the spending and growth within the national economy.

Our results show that economic sanctions are shown to have a statistically insignificant effect on either government expenditure and investment. This conclusion is important in several regards. Governments may not be making the effort to use their expenditure to partially depress the negative effects in imports, exports, and consumption; Target regimes frequently force the general population to burden the cost of economic sanctions caused by sanctions while leaders insulate themselves (Hufbauer et al., 2008). An alternative reason is that governments may not find economic sanctions sufficiently damaging to justify an increased level of expenditure. This hypothesis is validated by the "buying allies" effects caused by trade diversion and black knights. Secondly, sanctions are not adversely affecting businesses' levels of investment. Businesses could be prioritizing other economic or political factors in their decision to invest, such as overall economic output and product demand. These conclusions are vitally important to sender nations depending on their aims and objectives. For example, attempts by both sides of the Cold War to implement sanctions in order to influence a nation's ideology on the government's role and its spending may be fruitless. In conclusion, these results show that economic sanctions are only aggregately affecting a target's levels of imports, exports, and consumption.

[1] A case of study of sanctions against Iraq during the 1990's found that commodity prices skyrocketed over 1000%, effectively crippling the consumer market (Cashen 2017).

4.2 Sanctions issued by the United States

For the second hypothesis in our study, sanctions imposed by the United States are compared with sanctions issued by the rest of the world. The chart below shows the vast extent to which the United States issues sanctions. The United States compromises of over 60% of the global threats and imposition of sanctions since 1960. Because the United States constitutes the majority of sanction impositions, perhaps sanctions imposed by the United States impact the target in a fundamentally different manner than from the rest of the world.



This chart sums the duration that a type sanction lasted and is classified into either "World" or "USA". This metric captures both the frequency of implementation and intensity (number of years). In episodes with multiple senders, only the primary sender is captured. This charts shows the extent to which sanctions issued by the United States make up the global number of sanctions issued.

Source: TIES Dataset

Table 2: USA vs. Non-USA Sanctions

Variable Log( )	(1) Imports	(2) Exports	(3) Consumption	(4) Government	(5) Investment
Threat - Non-USA	0.0485*	0.0732***	0.000694	0.0527***	-0.0347
	(0.057)	(0.006)	(0.977)	(0.010)	(0.447)
Limited - Non-USA	-0.0736	-0.255*	-0.0117	-0.108	-0.0353
	(0.542)	(0.097)	(0.742)	(0.291)	(0.883)
Moderate - Non-USA	0.00630	-0.00885	0.0592	-0.0337	0.121***
	(0.868)	(0.883)	(0.272)	(0.418)	(0.009)
Extensive - Non-USA	-0.0712	0.0416	0.0882	-0.00948	0.248
	(0.310)	(0.575)	(0.258)	(0.863)	(0.199)
Threat - USA	0.0673**	0.0708**	0.0333	0.0536***	-0.0215
	(0.011)	(0.036)	(0.171)	(0.010)	(0.687)
Limited - USA	-0.129***	-0.149***	0.00478	-0.0135	0.0593
	(0.000)	(0.003)	(0.879)	(0.737)	(0.569)
Moderate - USA	0.0681	0.0810	-0.0241	0.00758	-0.0881
	(0.182)	(0.163)	(0.614)	(0.890)	(0.173)
Extensive - USA	-0.365**	-0.403*	-0.160***	-0.0751	0.0183
	(0.021)	(0.091)	(0.000)	(0.415)	(0.812)
$\text{Log(GDP Per Capita)}_{t-1}$	0.469***	0.525***	0.523***	0.565***	1.016***
$\text{Log(Population)}_{t-1}$	0.195	0.139	0.532***	0.210	-0.602
Minor Conflict	-0.0829*	-0.154**	-0.0771**	-0.0745*	0.175
Major Conflict	-0.141**	-0.221**	-0.0988*	-0.0224	0.200
Constant	13.61***	13.93***	9.383***	12.18***	21.87***
Observations	5123	5122	4773	4957	1745
Within R^2	0.910	0.892	0.930	0.892	0.663
p-values in parentheses	* p<0.1	** p<.05	*** p<.01		

Source: World Bank Indicators & TIES Dataset

Differentiating between sanctions imposed by the United States and sanctions imposed by the rest of the world shows that the U.S.-backed sanctions lead to more negative effects in the target's imports, exports, and consumption.[2] A commonality between the two classifications is the appearance of an anticipation effect. Whether the United States or another country imposes sanctions on a target; the components of GDP increase prior to the event.

Despite the threat commonality, US issued sanctions differ from the rest of the world in their effect Most notably, extensive sanctions issued by the United States resulted in significant decreases in the target country's imports, exports, and consumption. Under the imposition of US-sponsored extensive sanctions, the target country's imports suffered a 36.5% decrease, exports a 40.3% decrease, and consumption a 16% decrease. These results suggest that the United States imposes broader or more tougher sanctions that more adversely impact the target than other countries (Hufbauer et al., 1997). Another explanation for this difference is the leverage the United States has as the largest economy of the world. As one of the global economic leaders, issuing extensive sanctions will likely cause significant economic harm to a target. Even under limited sanctions, a target country's imports and exports suffered more under sanctions from the United States than by those sponsored from other nations. This outcome is likely because the United States, which makes up the vast majority of economic sanctions, is a major donor of foreign aid. Governments often threaten nations or withdraw aid for foreign policy purposes (Apodaca, 2017). A withdrawal of aid could hurt the target economy and reduce foreigner's confidence both economically and politically.

Non-USA sanctions led to more modest declines in imports and exports than their American counterpart. None of the coefficients for extensive sanctions are statistically

[2] In this specification, only the primary sender is accounted for rather than all parties involved. In some cases, countries may collaborate with one another to impose sanctions. Therefore, these classifications may not be completely disentangled from one another.

significant. Except for exports at a 10% level, none of the limited sanctions demonstrate any statistical significance. The results agree with much of theory discussing the effectiveness of economic sanctions as described by Hufbauer et al. (2008). The effectiveness of economics sanctions is principally determined by two main factors: leverage and motivation. Except in a few specific case studies, no other country demonstrates greater economic leverage on an aggregate scale than the United States throughout the past five decades. This global economic strength allows the United States to coerce other nations more effectively than smaller, less integrated countries. However, this effectiveness of United States led sanctions is likely to be decreasing. As the globalism rises and the world economy diversifies, the United States loses much of its unilateral power. This applies to the political market place as described by Garoupa and Gata: the effectiveness of sanctions diminishes with the introduction of more trading partners.

4.3 Institution vs. Non-institution

The third hypothesis tests whether sanctions backed by institutions, such as the United Nations or World Trade Organization, are costlier to the target. An institutional backing provides a greater sense of legitimacy to the sender, which may inflict greater costs of noncompliance. The TIES dataset explains the institution dummy variable as, “The motion need not have been passed, but at least one member of the institution must threaten or propose that the body as a collective adopt sanctions against the target” (Morgan et al., 2013). This definition dilutes the definition of the variable, since the backing of an institution may have not actually occurred. The output (Table 3) on the following page discusses the impact that a sanction backed by an institution would have on the various components of GDP.

Table 3: Institution-backed Sanctions

Variable Log( )	(1) Imports	(2) Exports	(3) Consumption	(4) Government	(5) Investment
Threat - Non-institution	0.0539** (0.010)	0.0668*** (0.008)	0.0179 (0.127)	0.0225 (0.205)	0.0307 (0.541)
Limited - Non-institution	-0.111*** (0.007)	-0.136*** (0.006)	0.0127 (0.571)	0.00498 (0.908)	0.0324 (0.740)
Moderate - Non-institution	-0.00632 (0.902)	0.00847 (0.874)	0.0392* (0.066)	0.0648** (0.047)	-0.0375 (0.486)
Extensive - Non-institution	-0.139** (0.013)	-0.117* (0.077)	-0.0960** (0.032)	-0.0146 (0.846)	-0.0490 (0.712)
Threat - Institution	0.0946* (0.068)	0.101* (0.058)	0.0375 (0.124)	0.135*** (0.005)	-0.0855 (0.124)
Limited - Institution	-0.204*** (0.006)	-0.310** (0.011)	0.0352 (0.573)	-0.230*** (0.002)	-1.114*** (0.000)
Moderate - Institution	0.0709 (0.269)	0.0849 (0.184)	0.0105 (0.797)	-0.109 (0.160)	0.0525 (0.530)
Extensive - Institution	-0.132 (0.345)	-0.0763 (0.699)	-0.0291 (0.591)	-0.0344 (0.598)	0.440* (0.072)
$Log(GDP\ Per\ Capita)_{t-1}$	0.472***	0.527***	0.523***	0.564***	0.989***
$Log(Population)_{t-1}$	0.181	0.125	0.531***	0.238	-0.666*
Minor Conflict	-0.0766*	-0.147**	-0.0751**	-0.0727*	0.152
Major Conflict	-0.140**	-0.219**	-0.0969*	-0.0143	0.156
Constant	13.80*** (0.000)	14.14*** (0.000)	9.389*** (0.001)	11.75*** (0.000)	23.08*** (0.001)
Observations	5123	5122	4773	4957	1745
Within R^2	0.910	0.891	0.930	0.892	0.664

p-values in parentheses * p<0.1 ** p<.05 *** p<.01

Source: World Bank Indicators & TIES Dataset

Analyzing the threat dummy variable, an anticipation effect is still observed at a statistically significant level. The most drastic effect is demonstrated by institution-backed threats to a target's government expenditure, with threats leading to increase of government expenditure by 13.5%. In general, targets displayed a greater anticipation effect under the threat of a supranational institution sanction than when not backed by an institution. This is likely due to the greater sense of legitimacy and severity that the threat of an institution-backed sanction gives (Bierstecker and Bergeijk, 2015).

Limited sanctions backed by institutions show a stronger effect than their non-institution counterparts in imports, exports, government expenditure, and investment. Limited sanctions not backed by institutions only demonstrated statistically significant coefficients for both imports and exports. Institutions may provide economic leverage through an engaged coalition of countries that can freeze leaders' assets, ban visa access, or restrict foreign aid. These measures are often used against corrupt regimes in order to fight human rights violators, issues core to the mission of institutions such as the UN. Increases in corruption and resource diversion are common, unintended consequences of institutions backing sanctions (Bierstecker et al., 2013). These targeted sanctions towards leaders that violate human rights issues could be why government expenditure is most significantly affected, as corruption shifts resources away from public spending. Institutional backing may restrict the number of participants in the political marketplace willing negotiate with target government, since the perceived costs of cooperation are now much higher (Garoupa and Gata, 2000).

Lastly, extensive sanctions not backed by institutions are actually shown to be more effective than their counterpart. Imports, exports, and consumption all fell by 13.9%, 11.7%, and 9.6%; respectively. This seems counterintuitive, since one would expect that institutions would increase the effectiveness of the most severe form of economic punishment. This could be due to a certain aspect of restraint that an international institution may hold. International institutions such as the UN are designed to foster stability and cooperation among nations.

The aims and objectives of these institutions may differ from a government seeking to punish another nation for geopolitical objectives or political ideology. Bierstecker et al. (2013) found that UN sanctions are more targeted in their application, rather than broad and extensive. They found that broad sanctions intended to complement UN issued sanctions cause conflict and potentially weaken the effects of the sanctions. Sanctions are most effective when they are implemented quickly and decisively (Hufbauer et al., 1997). For this reason, extensive sanctions are shown to have a stronger, statistically significant effect by non-institution sanctions for their lack of restraint and more direct implementation.

4.4 Democracies vs. Autocracies

This section tests whether democracies are affected differently than autocracies in the event of a sanction. This is measured by using an interaction variable between the different levels of sanctions and a dummy variable that takes a value of 1 if the target government is an autocracy, and 0 otherwise. The results are presented on the following page.

Autocracies are affected more adversely than their democratic counterparts. In the non-interacted component that measures economic sanctions against both democracies and autocracies, limited sanctions are shown to have a statistically significant negative effect on both imports and exports. Introducing the autocracy interaction indicates that an autocracy's imports and exports are not affected by limited sanctions at a more adverse level. Limited sanctions did affect the autocratic government's expenditure more adversely than the standard model, likely due to corruption issues. Limited sanctions such as retracting foreign aid, banning visas, or freezing foreign assets; are frequently used against autocratic regimes to minimize the collateral damage suffered by the civilian population. These limitations could cause corrupt governments to turn to the nation's resources, thereby decreasing expenditure.

Table 4: Impact of Sanctions on Autocracies

Variable Log( )	(1) Imports	(2) Exports	(3) Consumption	(4) Government	(5) Investment
Threat	0.0412** (0.017)	0.0692*** (0.001)	0.0289** (0.037)	0.0488*** (0.004)	-0.0119 (0.763)
Limited	-0.132*** (0.001)	-0.168*** (0.003)	0.0109 (0.735)	0.0414 (0.367)	-0.0355 (0.791)
Moderate	0.0864* (0.063)	0.0959** (0.046)	0.0412 (0.130)	0.0473 (0.240)	-0.0330 (0.551)
Extensive	-0.0999 (0.101)	-0.0682 (0.423)	-0.0588 (0.131)	0.0500 (0.517)	0.144 (0.273)
Threat - Autocracy	0.0384 (0.523)	-0.00423 (0.945)	-0.0178 (0.429)	-0.00136 (0.970)	0.0834 (0.454)
Limited - Autocracy	0.0122 (0.848)	0.0208 (0.810)	0.00950 (0.817)	-0.126* (0.062)	0.177 (0.508)
Moderate - Autocracy	-0.142** (0.026)	-0.134* (0.052)	-0.0337 (0.449)	-0.115 (0.137)	0.0559 (0.502)
Extensive - Autocracy	-0.0517 (0.731)	-0.0386 (0.843)	-0.00834 (0.885)	-0.109 (0.261)	0.0374 (0.912)
$\text{Log(GDP Per Capita)}_{t-1}$	0.470***	0.526***	0.523***	0.565***	1.012***
$\text{Log(Population)}_{t-1}$	0.218	0.162	0.537***	0.228	-0.596
Minor Conflict	-0.0761	-0.146**	-0.0741**	-0.0718*	0.168
Major Conflict	-0.138**	-0.217**	-0.0973*	-0.0201	0.194
Constant	13.24***	13.58***	9.299***	11.89***	21.78***
Observations Within R^2	5123 0.910	5122 0.892	4773 0.930	4957 0.892	1745 0.661

p-values in parentheses * p<0.1 ** p<.05 *** p<.01

Source: World Bank Indicators & TIES Dataset

Moderate sanctions are shown to have a statistically significant decrease in an autocracy's imports and exports. This does not suggest that democratic governments are intrinsically more capable at absorbing the negative shocks dealt by economic sanctions. Although democracies are generally more economically stable (Quinn and Woolley, 2001), the conclusions stated above are likely to suffer from a severe selection bias. Autocratic regimes are more likely to be culprits of particular type of sanctions than a democracy would. A sender, depending on their political ideology, may be more likely to impose harsher sanctions depending on the target's government type. A democracy is less likely to target nations that it shares a similar economic and political ideology with. This self-selection bias shrouds the true effects of sanctions.

5. Conclusion

Our study used a panel data fixed effects model to analyze the effects of economic sanctions on the five components of GDP: imports, exports, consumption, government expenditure, and investment. In the standard model (Hypothesis 1), the presence of economic sanctions resulted in broad negative effects for imports, exports, and consumption; while government expenditure and investment were not affected at a statistically significant level. These outcomes were accompanied by an anticipation effect that led to small increases of imports, exports, consumption, and government expenditure in the presence of a threat. Sanctions implemented by the United States (Hypothesis 2) led to slightly more adverse outcomes in the target's imports than sanctions implemented by rest of the world due to its economic leverage and willingness to issue sanctions of greater severity. The effect of an institution backing a sanction episode (Hypothesis 3) led to mixed results. Institutions had more adverse effects on imports, government expenditure, and investment for limited sanctions, while extensive sanctions without the backing of an institution led to harsher outcomes in imports, exports, and consumption. Lastly, Hypothesis 4 showed that autocracies

were more adversely affected by sanctions than their democracy counterparts, but this conclusion could be muddied by a self-selection bias.

For decades, scholars and politicians have debated the consequences of economic sanctions. Some episodes lead to a triumphant success that promoted a foreign initiative while obviating the costs of war. Others were catastrophic failures that were unable to accomplish their objectives while handicapping economic growth and human welfare. Despite these costs, economics sanctions are increasingly utilized for their ability to circumvent warfare while pursuing foreign policy aims. Although the true costs of sanctions are difficult to quantify given the myriad of economic, political, and demographic variables that are in play; it is now more important than ever to study these foreign policy tools.

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